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<b>(54) Title: APPARATUS AND METHOD FOR GENERATING A RECEIPT</b>					
<b>(57) Abstract</b>					
<p>In a betting shop terminal (60), a betting slip (80, Figure 8) is inserted into a slot (51), and pressed against a glass plate (55) by means of a hinged plate (53). A CCD camera (54) generates an electrical image of the betting slip, and stores it in a memory. A thermal printer (52) generates a hard copy of the image of the betting slip, from the stored electrical image signal, together with additional information, to form a receipt for the customer. The additional information comprises a unique serial number, the amount of the stake, and optionally the time of the bet. This information is stored also in the memory, together with the electrical image. The bet can be fully entered at a later time, subsequent to the transaction, by a settler, using the terminal (60) or an alternative terminal. Winning bets are automatically calculated from the entered information and race information received from a remote station. A plurality of terminals such as (60) intercommunicate to process shared data. A remote station can receive data relating to bets taken, etc., from the terminal (60) over a communication link.</p>					

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## APPARATUS AND METHOD FOR GENERATING A RECEIPT

This invention relates to apparatus and methods for generating a receipt and is concerned particularly, although not exclusively, with betting shop systems.

In a known betting shop system, a customer wishing to place a bet fills out his own betting slip. The slip is in two parts, a top copy and a bottom copy. Anything written on the top copy is copied onto the bottom copy by a known chemical process. The details written on the slip relate to the place and time of the race, the name of the horse or dog selected, and the amount of the stake. The customer has a choice of starting price or board price odds. Starting price odds are the odds prevailing at the start of the race itself. Board price odds are the odds that prevail at the time of the bet. If a customer asks for a board price, the till operator usually verifies the odds by referring to continually updated information supplied to the betting shop. Once the odds have been verified, they are written on the slip by the till operator, and highlighted by, for example, the till operator putting a red ring around the odds. The till operator then takes the stake money from the customer, puts the slip in a print mechanism of the till and enters the stake on the till, whereupon the stake value and a unique serial number are printed on the top and bottom copies of the slip. The till operator then puts the stake money in the till drawer, removes the slip from the till print mechanism, parts the two halves of the slip, gives the bottom copy to the customer and feeds the top copy through a camera mechanism where a photograph is taken, the camera mechanism containing a digital clock which is photographed along with the betting slip to establish the time the bet was taken. The photograph

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serves as a permanent record of the details of the bet, including the board price if taken, and the time the bet was taken.

5       The till operator retrieves the top copies of the slips from the camera mechanism and passes them to the settler.

10      The function of the settler is to scrutinise the bets in order to compute the value of winning bets. The settler enters the value of a win onto the top copy of the slip and passes it to the payout operator. Losing slips are put to one side.

15      When a customer presents the bottom copy of a winning bet to the payout operator, the two parts of the slip are scrutinised to see that no alterations have been made. If all is correct, the payout operator gives the customer the amount written on the top copy of the slip by the settler, attaches the two parts of the slip together, and passes them to the settler.

20      The camera record and winning and losing slips are taken to Head Office from time to time, where they are inspected in an attempt to detect if any cheating is occurring, either by a customer and/or by betting shop personnel.

25      A problem with known betting shop systems is that if a board price is requested, it must be manually applied to the betting slip. As the odds vary over a period of time, errors may be made by the operator, and the wrong odds may be applied.

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A second problem is that it is not easy to go back and check that the odds applied to the slip were correct at the time the bet was taken, since the photographic record that is taken is not immediately and conveniently available, and this record has to be checked against a master record of the  
5 day's events.

A third problem is that the verification of a winning bet by the payout person is time consuming.

10 A fourth problem is that the settler calculates the value of winning bets manually and can make mistakes. Generally customers inform the shop staff of underpays but not overpays, and consequently the shop's profitability is reduced.

15 A fifth problem is that, if the bet is a multiple bet having several selections in the form of doubles, trebles and accumulators, the settler has to handle the bet several times, thus increasing the possibility of error.

20 A sixth problem is that the security checking of camera records against slips can only be done when the film and bets have been collected from the shop and the film processed. This may entail a delay of three to four weeks.

A further problem is the time taken to check a winning bet against the camera records since the photograph of the bet has to be found on the film.

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Preferred embodiments of the present invention aim to provide betting shop systems, or apparatus or methods therefor, which may be improved in the foregoing respects.

5 More generally, according to one aspect of the present invention, there is provided apparatus for generating a receipt, the apparatus comprising:

an input portion for receiving a slip having characters thereon;

10 electrical imaging means for forming an image of a slip in or at said input portion and generating an electrical image signal representing said image; and

15 output means for receiving said image signal and generating therefrom a receipt comprising a hard copy of said image together with additional identifying information.

Preferably, said input portion comprises a recess to receive a slip therein.

20 Such apparatus may include optical means for transmitting to the electrical imaging means an optical image of a slip in or at said input portion.

25 Preferably, said electrical imaging means comprises a two-dimensional array of light sensitive elements.

Preferably, said elements comprise charge-coupled devices.

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Preferably, said output means comprises a printer - for example, a thermal printer.

Said additional identifying information may be adjacent said image on  
5 said hard copy.

Preferably, said additional identifying information comprises a unique serial number, and/or an indication of the time when said receipt is generated, and/or an indication of a sum of money received.

10

Said additional identifying information may comprise a bar code.

The apparatus may further comprise key means for entering control instructions for said apparatus and/or information which is displayed on said  
15 receipt with said image.

Said output means may comprise means for housing a roll of record medium on which successive said receipts are generated, and means for facilitating tear-off of successive said receipts from said record medium.

20

Preferably, the apparatus further comprises storage means for storing successive said image signals.

Preferably, the apparatus further comprises display means for  
25 selectively displaying an image corresponding to a selected one of said image signals stored in said storage means.

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Preferably, the apparatus further comprises key means for entering data, and means for storing the entered data in said storage means with the respective said image signal corresponding to an image that is displayed on said display means at the time that the data is entered by said key means.

5

Preferably, the key means for entering control instructions and/or information and the key means for entering data comprise a common key means.

10

Preferably, said display means is arranged to display a respective said image at one portion of a display area, and additional data at at least one other portion of the display area, which data can be selected or entered by said key means for entering data.

15

Preferably, said display means is arranged to display at least one display window at a portion of the display area, which window contains multiple choice data items that can be selected or entered by said key means for entering data.

20

Preferably, said multiple choice data items relate to selectable betting rules.

Preferably, said display means is arranged to display in a portion thereof the name and/or number of a selected runner in a race.

25

The apparatus may further comprise a cash drawer.

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The apparatus may further comprise a magnetic card reader, means for carrying out a transaction with a card read by said reader, and means for storing data corresponding to an amount of money received by such a transaction.

5

The apparatus may further comprise a bar code reader for reading a bar code on a said receipt, means for decoding the read bar code, and means for retrieving from said storage means data relating to said receipt.

10

The apparatus may further comprise communication means for receiving and/or transmitting data from and/or to a remote station.

Preferably, such an apparatus is arranged to receive current values of variable betting data from a remote station.

15

Such an apparatus may be arranged to transmit data to a remote station for analysis, which data relates to a plurality of transactions over a period.

20

A plurality of apparatuses as above may be arranged to share and process common data.

25

The invention extends to a combination of at least one apparatus according to any of the preceding aspects of the invention, together with a said slip which is a betting slip containing information relating to a bet to be placed.

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The invention extends to a betting shop provided with at least one apparatus according to any of the preceding aspects of the invention.

According to another aspect of the present invention, there is provided  
5 an apparatus for generating a receipt and storing data relating to a transaction,  
the apparatus comprising:

an input portion for receiving a slip having characters thereon;  
10 electrical imaging means for forming an image of a slip in or at said  
input portion and generating an electrical image signal representing said  
image;

means for storing said electrical image signal; and  
15 output means for generating a receipt comprising said slip or a hard  
copy of said image, together with additional identifying information.

Such an apparatus may further comprise any one or more of the  
20 features disclosed in the accompanying specification, claims, abstract and/or  
drawings, in any combination.

According to a further aspect of the present invention, there is provided  
a method of generating a receipt, comprising the steps of:

25 locating a slip in or at the input portion of an apparatus according to  
any of the preceding claims;

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forming an image of the slip and generating an electrical image signal representing the image by the electrical imaging means of the apparatus; and

generating the receipt by the output means of the apparatus, the receipt comprising said slip or a hard copy of said image, together with additional identifying information.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, 10 to the accompanying diagrammatic drawings, in which:

Figure 1 is a schematic diagram of an example of a betting shop system according to the present invention:

15 Figure 2 is a block diagram of a till of the system of Figure 1;

Figure 3 is a similar block diagram of a settler-payout terminal of the system of Figure 1;

20 Figures 4 and 5 are schematic diagrams of display screens of a settler-payout terminal;

Figure 6 illustrates, in longitudinal section, one example of a preferred apparatus embodying the invention;

25 Figure 7 illustrates, in longitudinal section, another example of a preferred apparatus embodying the invention; and

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Figure 8 illustrates a typical betting slip.

Referring to Figure 1, a betting shop system 10 comprises a settlers terminal 12, a payout terminal 13, three tills 14, 15, 16 and a video controller 17. The units 12 to 17 communicate with one another via a high speed data path (HSDP) 18. The HSDP 18 comprises a two wire multi drop line. The settlers terminal 12, which acts as a master terminal, continuously polls the other terminals (slaves) to see if data interchange is required. If it is, the source and destination between which the data is to be interchanged are informed by the master, and the transfer takes place. The data rate over the HSDP 18 is preferably a minimum of 1 megabit per second.

In the event that one of the slaves fails, the operation of the HSDP will not be affected. Also, if the settlers terminal (the master) fails, the payout terminal 13 will become master.

An alternative communications system, such as, for example, a simple ring connection of terminals via their communications ports, may be employed - optionally at a lower data transmission rate.

A communications network 11 interfaces a central site 19 to the settlers terminal 12. The central site contains data relating to races on which bets may be taken. Data received from the central site 19 is stored in the settlers terminal 12 and transferred over the HSDP 18 to the relevant recipients. Data received or generated by the settlers terminal 12 is stored and passed to the central site 19 when polled by the central site 19.

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Referring to Figure 2, a till 14 is shown in more detail. The till is a self-contained unit comprising the elements shown in Figure 2.

The till comprises a microprocessor 21 system optimised to the till's functionality. Any expansions may be carried out by an internal add-on card or via an RS232 interface.

Software for the till is downloaded from the master 12 on power-up, thus enabling easy update of operational parameters.

10

Information relating to a transaction may be displayed on a display 22, which comprises a 256 x 64 liquid crystal display (LCD) whose prime function is to display an amount entered by a keyboard 23. Its secondary function is to display information, and to this end it can be perceived as a 15 40 x 8 character display.

Information relating to the amount of a stake, and details of the race and horse and/or dog (for example) may be input into the till by means of the keyboard 23. The keyboard may comprise numeral keys 0 to 9 as well as 20 keys which enable information to be cancelled, entered, copied or displayed in a usual manner. To enter the value of a bet, the operative presses the relevant numerical key(s) followed by the enter key. A cancel key is used to correct mistakes. To look at current betting information, the operator presses a "current show" key, whereupon the details of the next race to be run are 25 displayed on the LCD 22. Further depressions of the current show key cause the next but one, next but two, etc. races to be displayed.

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A slip printer 24 is similar to a conventional slip printer, but with a normal bet, only prints one line on the bottom copy, which is typically offset from the top copy. This line consists of a unique bet serial number and bet value - and optionally the time of the bet. The printer has, however, the 5 ability to print more than one line by line feeding the slip.

Whilst the slip is in the slip printer 24 and printing is taking place, optics 25 focus the written area of the bet onto a charge-coupled device (CCD). A digitiser 26 consists of an analogue to digital convertor and timing 10 element, and its function is to take an electronic "picture" of the bet in monochrome, by means of the CCD. The optics 25 and the digitiser 26 together replace the flow camera used in known betting shop systems.

The tills 14 to 16 can communicate with the master 12 via the HFDP  
15 18. The information communicated may include:

1. Bet serial number and time (from the master);
2. Bet value (to the master);
3. Digitised picture (to the master);
4. Betting information (from the master).

20

All information between master and slaves is archived by the payout terminal 13 (Figure 1) in order that, should the master 12 fail, the payout terminal 13 can act as master.

25

The RS232 interface 28 may be used for simple expansion - for example, to control such peripherals as a special purpose printer, or a

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magnetic stripe reader for reading credit cards. A cash drawer interface 29 comprises a conventional till output to open the cash drawer.

The settlers terminal 12 and payout terminal 13 are identical in that  
5 they run the same program and maintain identical databases.

The settlers terminal 12 is connected to the communications network 11, whereas the payout terminal is connected to the public switch telephone network (PSTN) 20. In practice, the only difference between the settlers 10 terminal 12 and the payout terminal 13 is that the settlers terminal 12 acts as HSDP 18 master and interfaces to the communications network 11, whilst the payout terminal 13 acts as HSDP 18 slave. In the event of communications network 11 or settlers terminal 12 failure, the payout terminal 13 can take over as HSDP 18 master, communicating with the central site over the PSTN 15 20.

The settlers terminal and payout terminal are shown in more detail in Figure 3. The settler/payout terminal 12, 13 comprises a processor 31 comprising a 386 motherboard with sufficient memory to run the application. 20 Additional memory slots will be available for expansion. A disc 32 is used to hold various types of information which includes the days runners and results, ante post betting information, the tills' program, the video systems program, a copy of the video systems database; digitised pictures of bets taken; bet details as entered by the settler; an audit trail for the Customs and 25 Excise; and a copy of the terminals program. A keyboard 33 comprises a standard PC keyboard having full QWERTY, numeric pad and function keys. However, a special purpose keyboard may be used if desired.

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A display 34 is a standard monochrome cathode ray tube (CRT) driven from a video store. This enables the screen to be used to display the digitised picture of a bet as well as alphanumeric information in various sizes and shades of grey (or other colour).

5

A clock 35 in the terminal is set periodically by the clock at the central site 19 (Figure 1). This ensures that the central site and all shops in the system are synchronised with respect to time. A tally roll printer 36 may be attached to the terminal if required - e.g. for the Customs and Excise. HSDP interface 37 allows the terminal to communicate with the rest of the system  
10 10.

A cash drawer interface 38 is similar to the cash drawer interface 29 described in Figure 2 in relation to the till.

15

The PSTN interface 20 enables the payout terminal 13 to gain access to the public packet switching network in order that pool bets can be transferred to a pool computer.

20

The video controller 17 (Figure 1) comprises a multi- screen bit-mapped graphic system, and its function is to display betting information and results in a quality form. The video controller 17 receives an overnight transmission of its database from the central site 19, which comprises race and display information. When the shop is open, the central site 19 transmits data  
25 which includes current prices, results, ante post price changes, and what to display on each screen.

- 15 -

The settler/payout terminal 12, 13 receives this information concurrently in order to establish copies of the video controller 17 database and for bet acceptance and settling. Current betting information received from the central site may be displayed on one or more video display system.

5

The betting shop system 10 works as follows.

A customer wishing to make a bet gives a betting slip with the appropriate money to a till operator who puts the slip in the printer 24 of the  
10 till 14, and subsequently takes the slip out of the printer 24. If the customer has requested a board price, the till operator may enter the requested board price manually onto the slip or call up on the till the prevailing odds and enter them manually onto the slip, prior to putting the slip in the printer 24. Alternatively, the operator may cause the till to print the odds on the slip  
15 while in the printer - either automatically from current racing information received from a central site, or by keyboard entry by the operator. Following printing, the operator then divides the slip into two parts and gives the customer the bottom copy, whilst putting the top copy on a pile by the till.

20

While the slip was in the slip printer 24 in the till 14, the betting system 10 has allocated the betting slip a unique serial number, and printed the unique serial number and the amount taken on the bottom copy of the slip. Some or all of the printed data may be in bar code form. In addition, the time at which the slip was printed has been noted, and a digitised picture of  
25 the betting slip has been taken and recorded on the disk 32 in the settlers/pay out terminal along with the serial number, amount of bet, the time of the bet and board price if applicable.

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The serial number may be chosen to have two check digits. This means that an operator would have to make three keying errors in order to select an unintended bet.

5        In due course the settler may call up the picture of the bet on the settlers terminal from the storage means, read the information on the slip and enter the bet into the terminal in a form understandable to the terminal. The bet entry may be effected by an operator operating the settler/payout terminal. In order to enter a bet into the system, the terminal operator selects the bet  
10      to be entered, causing the terminal to bring up the digitised copy of the bet onto the display 34, together with a form shown in Figures 4 and 5. The operator is then able to fill in on-screen the form required to enter the bet by means of the keyboard.

15      It will be noted that the operator of the terminal 12, 13 only has to look at the screen of the terminal, and the physical copy of the bet is not required.

When a bet entry is completed, the next unentered bet in sequence is automatically brought up on display. To select a particular bet, the operator  
20      enters the bet serial number. If required, the operator may skip over a bet, and the display will continuously show the number of unentered bets behind and in front of the bet currently on display.

By means of the keyboard, the operator selects the bet type, which may  
25      be displayed in reverse video. "WIN" (field 1) may be a default selection, with "EACH WAY" (field 2) an optional alternative. If forecast or reverse forecast (fields 3 and 4) are selected, the space for the name and SP (Starting

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Price) (field 9) is increased to 2 lines. Similarly, if tricast or reverse tricast (fields 5 and 6) are selected, the space is increased to 3. If an accumulator (field 7 or 8) is selected, the display changes to a menu to allow the relevant accumulator to be selected.

5

To enter a horse/dog name the operator begins to type characters. After each key depression, a list of names that begin with the letters so far entered is displayed below the table. When only one name is left the terminal fills in the rest of the name and "beeps" (tone 1). It also displays the race time and place. If several names have common lettering, the terminal "beeps" (tone 2) to allow the operator to skip over the common section.

10 To enter a horse/dog number, the operator types the race time and place followed by the number. When the terminal has identified the unique race (e.g. 12:34 for the 12:34 at Hackney or 1:30 S for the 1:30 at Sandown) it "beeps" (tone 2) and fills in the remainder.

15 At field 9, the terminal defaults to SP, but if a board price was taken, the operator enters the board price, which is then displayed in reverse video.

20 If the board price is already stored - either by automatic or keyboard entry at the till transaction - the stored odds are displayed automatically at field 9, in reverse video.

25 At fields 10 and 11, the operator may select between racing rules (default) and first past the post (reverse video), and tax paid (default) and not paid (reverse video). The terminal automatically enters the stake and total.

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Reverse video is used so that the operator can see at a glance the type of bet entered.

The settlers terminal may receive information from the central site  
5 relating to the results of races, whereupon the terminal automatically settles  
the bets so far entered into the system and passes the results of those  
calculations to the payout terminal by means of the communication system.

When a customer has won a bet, he presents the bottom copy of the  
10 slip to the payout terminal operator. The operator then enters the serial  
number into the terminal, checks that the slip is valid, and pays the client his  
winnings as indicated by the terminal. Meanwhile, the betting shop system  
10 has displayed the digitised copy of the bet on the terminal, and marked the  
bet as paid. If the serial number (and other data) on the slip was printed as  
15 a bar code, it may be read by a bar code reader at the terminal.

It will be noted that the payout terminal operator does not need the top  
copy of the slip, since it is automatically brought up on the display, thus  
easily enabling the operator to check that the slip is the correct one, and that  
20 it has not been interfered with.

The system may also be used to take pool betting. In pool betting, the  
customer puts marks on the betting slips to indicate the selection in a manner  
similar to that in which crosses (or other marks) are used on a football pool  
25 coupon. The bet is taken by the till operator in exactly the same way as a  
normal bet. The betting shop system 10 functions in a different way as  
follows.

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It allocates the bet a unique serial number, takes a digital picture of the betting slip, decodes the bet from the digitised image, makes contact with the pool computer and informs it of the bet, and receives back from the pool computer a pool bet serial number. It then prints the two serial numbers, the  
5 amount taken and the bet onto the bottom copy of the slip. It further notes the time the slip was printed and records the bet, the digitised slip, the time and serial numbers onto the terminal disk 32.

If the pool computer does not respond within a time out period of say  
10 3 seconds, only the serial number and the amount are printed and the slip is released. The till's display indicates that the transaction has not been completed. The till operator can then take the slip to one side and continue taking bets from other customers. When the transfer with the pool computer is complete, the message can be displayed on the till and the till operator can  
15 then re-enter the slip into the printer for the bet details to be printed.

The bet taken in this way does not need to be entered normally, as it was entered during the take process. When the results are received from the central site 18, the terminal makes contact with the pool computer and settles  
20 all winning bets. The pay out process is the same as described above for normal bet slips.

The betting shop system is useful in detecting whether any cheating is occurring. If any query arises in the shop, the shop personnel have available  
25 to them the top copy of the slip, a bottom copy of the slip, a digitised image of the slip, information relating to what was printed on the bet (serial number and amount) and the exact time the bet was taken. If when entering a board

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price, the price was not current at the time the bet was taken, the terminal "beeps" (tone 3) and displays the board prices with times. The operator take whatever action seems necessary in the circumstances. In this respect, it is to be understood that betting shop managers often have discretion to accept 5 a bet at an earlier price, especially if taken just as the price is changing or has just changed.

The betting shop system 10 may be used in a chain of betting shops which have a head office. The head office can request any of the information 10 held on the terminal disk 32, including bets entered together with the digitised copies, either on demand or as part of an overnight transmission. Due to the size of the digitised copies, it may not be practicable to transmit all bets from all shops to the head office overnight. However, all information entered by a terminal operator can be transmitted to the central site 18. The central site 15 may send data to the head office as required.

The betting shop system 10 may also hold information concerning a complete day's operation. This operation can be packaged in whatever form is required and transmitted overnight.

20

By means of the betting shop system 10, all the functions of a betting shop maybe combined into one electronic whole. These functions may include:

25

1. Display of betting and result information.
2. The taking, settling and pay out of bets.

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3. Security of betting shop operation, i.e. owners protecting themselves from clients and betting shop personnel.
  4. Management information, i.e. take and pay out of shop, ratio of bet types.
  5. Ante-post information not on display but available to shop personnel on request from clients.
- 10           6. Large bet verification and liability calculation.
7. Tracing of bet from placement to entry in accounts system, to satisfy Customs and Excise
- 15           8. The taking and processing of pool bets.

The betting shop system 10 described above comprises three tills 14. However it is to be understood that the system 10 may comprise any number of tills, settling and payout terminals.

20

The betting shop system 10 is particularly useful in providing a totally automated betting system which may be used to co-ordinate activities occurring in a number of shops in a chain, in supplying a head office of the chain with relevant information.

25

By using a digitised image of the betting slip, pool bets of the mark sense type can conveniently be processed, and thus do not require a separate

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mark sense reader. "Mark sense" type betting slips are those where predetermined selections are marked with a cross, or other character or mark. A reader reads the characters or other marks on the slip.

5       Figure 6 shows schematically an improved terminal 60 for inputting betting slip details. This comprises a receiving slot 50 into which a betting slip 51 can be introduced after relevant details have been written and/or printed thereon. A support for the slip 51 comprises a back plate 53 which is preferably, though not essentially hingedly mounted, and which can be  
10      moved manually to a position against a glass plate 55, such that the information on the slip can be focused onto a CCD device 54 which then takes an electronic picture of the slip. The information on the slip therefore is moved to a position in which it can be "photographed" through a lens system. Preferably, the device houses means to use a CCD which is interfaced to a  
15      microprocessor in order to record digitally an electrical signal representing the image of the information on the slip 51. A cash drawer 56 is provided.

The printer 52 is preferably a thermal printer, and produces a receipt comprising an electronic "picture" of the betting slip 51 which was obtained  
20      by putting the betting slip 51 against the glass plate 55 and focusing the written area of the bet onto the charged coupled device 54.

An example of operation of the modified system of Figure 6 is as follows.

25

The betting slip 51 is in one part. A customer wishing to make a bet gives the betting slip 51 with the appropriate money to a till operator who puts

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the slip in the slot 50, enters the value of the bet into the till and puts the money in the cash drawer. During this process an electronic "picture" of the betting slip is taken and a facsimile of the bet is printed on the thermal printer 52 together with a unique serial number, bar code, the amount taken, and 5 optionally the time of the bet. The operator gives the customer the facsimile of the bet and puts the original slip on a pile by the till.

When a customer has won a bet, he presents the facsimile of the bet to the payout operator who uses a bar code reader to enter the serial number into 10 the payout terminal.

Delayed-time entering of the bet by a settler, calculation of a winning amount, and payout procedure, may be generally as described above with reference to the preceding embodiments.

15 The modified system can also be used for pool bets. The single piece coupon is read by the till and the bet details together with unique serial number and bar code are produced on the printer and given to the customer. The coupon is put on a pile by the tile.

20 The system contacts the pool computer over the PSTN or other network, as outline above in relation to the preceding embodiments. If the pool computer does not respond within a time out period, a message is displayed on an LCD display, informing the operator to continue taking other 25 bets. When the response occurs, the till informs the operator via the LCD, whereupon the operator can request the till to print out the bet and give it to the customer.

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In the system described with reference to Figures 1 to 5, the tills 15, 16, 17 and the settler/payout terminals 12, 13 were of differing constructions. This is not essential. For example, a plurality of terminals such as illustrated in Figure 6 may be provided in a betting shop, all provided with a display, 5 keyboard, printer, CCD camera device, cash drawer, etc., all being networked together and linked to one or more external site. Each terminal may function as a till or a settlers/payout terminal, as required. They may each have a respective memory to store all data necessary. One or more may be configured as masters, storing data and communicating with the remaining 10 slaves. A separate data storage and/or external communications terminal may be provided.

Thus by having a universal terminal such as shown in Figure 6, a betting shop system may readily be installed, with as many terminals as necessary, each terminal being adaptable as a till, settler terminal or payout 15 terminal, as demand requires. If preferred, a peripheral device such as a display screen or printer may be provided as a common device to one or more terminals.

20 As indicated above, delayed-time entering of a bet on a terminal such as that of Figure 6 may take place in a manner similar to that described above with reference to Figures 1 to 5, with particular reference to Figures 4 and 5. Indeed, where practicable, features mentioned in relation to the embodiments 25 of Figures 1 to 5 may be adopted in the embodiments of Figure 6, and vice-versa. Features may similarly be exchanged with the embodiment of Figure 7, described below.

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In the terminal 70 of Figure 7, an operator drops a betting slip into a slot 71, where its lower edge rests against a lower plate 72. The operator grasps an upstanding edge 74 of a plate 75, and moves a moveable assembly 73 to close the slot 71. The assembly 73 moves by a parallel-motion mechanism 76, whereby the plate 75 moves in parallel to a glass plate 79. The plate 75 preferably carries a sponge-rubber layer (or other soft facing) 78, which is urged by the operator against the glass plate 79, against which the slip is then pressed. At this point, a microswitch (or other detector) is operated, to cause a CCD camera device to take an electrical image of the slip at the glass plate 79.

The operator then releases the plate edge 74, which is resiliently biased back to an open position, whereupon the slip may be removed from the slot 71.

15

Preferably, the illustrated parts (at least) of the terminal 70 are built into a counter or desk top, below which the operative parts are located out of the way. A top plate 77 of the terminal 70 may serve as a counter or desk top, or be mounted flush with such a top.

20

After the CCD camera has taken the electrical image of the betting slip, a hard copy thereof is generated by a printer, which is not shown in Figure 7 but which may be, for example, a thermal printer similar to the printer 52 of Figure 6. The hard copy forms a receipt, which carries additional information thereon, such as a unique identifying number, the amount of the stake, the time of taking the bet, etc. This information may be presented

- 26 -

adjacent the image of the betting slip, or superimposed thereon. All or some of this additional information may be in the form of a bar code.

5       The additional information may be added to the electrical image of the betting slip as one or more further electrical signal, and processed simultaneously with the image signal in the printing (or other facsimile generating) step. Alternatively or additionally, it may be generated as a separate printing step, or the like.

10       The additional information may be entered, at least partially, by means of a keyboard, which is not shown in Figure 7, but which may be similar to keyboards already illustrated and described above. It is preferred that at least some of the additional information, such as the unique serial number and time of taking the bet, is received directly from a central processing unit or  
15       memory - either of the terminal 70 or a remote station (local or external).

Some or all of the additional information may be printed or otherwise entered onto the original slip - for example, whilst in or entering the slot 71 or in a preliminary pre-printing step or the like. If this is done before the  
20       CCD camera is operated, then the image may automatically include the additional information on it. In this case, the original slip may be returned to the customer as the receipt, and only the electrical image signals retained as the betting shop's record of the transaction. This gives the shop no automatic hard copy of the transaction, and therefore may be less satisfactory  
25       - although the additional hard copy printing step is then omitted. However, if a printer (such as the printer 52, for example), prints a facsimile of the

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betting slip with additional information already on it, then each of the shop and the customer may keep either the original or the copy.

In any event, the data relating to the transaction, including the electrical  
5 image of the betting slip, is stored in the system. Delayed-time processing  
(entering) of the bet may be carried out by a settler - for example, as  
described above - and likewise eventual payout. If desired, only winning bets  
may be entered and calculated for payout.

10 The delayed-time processing of bets may be particularly advantageous.  
Previous attempts, by whatever means, to input bets into a system have been  
frustrated by problems of real-time activity at the till transaction. In the  
above described embodiments of the invention, this problem has been  
overcome by inputting at the point of sale only those details that need to be  
15 known for security, thereby allowing delayed time input of the bet details,  
regardless of whether the event has been concluded and the results given.

In the above, the electrical image of a betting slip need not include the  
whole of the slip. For example, headings and logos may be extraneous  
20 matter, so far as bet entry and calculation are required, and occupy valuable  
storage space unnecessarily. Unwanted matter may be omitted by, for  
example, restricting the image field, and/or filtering of pre-printed matter of  
a selected colour. The latter may be particularly applicable to the processing  
of mark sense forms.

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By way of example, the layout of a typical betting slip 80 is shown in Figure 8. This is a two-part slip, having a top part 81 and offset or oversize bottom part 82 which extends below the top part.

5        In the above-described embodiments of the invention, the or each CCD device may conveniently comprises a 2-dimensional array of CCD elements. Alternatively, there may be provided a 1-dimensional array of CCD (or other light-sensitive) elements, with a suitable transport mechanism to facilitate line-by-line scanning of the betting slip. 2-dimensional arrays of elements may  
10      also be used with a transport mechanism, to facilitate scanning at more than one line at a time.

15       A communications link between betting shop terminal and an external site may be provided by a satellite link for receiving incoming information in the shop, and a hard-wired link (e.g. PSTN) for transmitting outgoing information from the shop.

20       Although thermal printers are mentioned in the above, alternative printers (e.g. impact, ink-jet or laser printers) may be used.

25       Although magnetic cards and magnetic card readers are mentioned in the above, cards and readers having alternative data storage and reader means (e.g. microchip memories and readers) may be employed.

25       The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and

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the contents of all such papers and documents are incorporated herein by reference.

All of the features disclosed in this specification (including any  
5 accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

10        Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar  
15      features.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any  
20      accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

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**CLAIMS**

1. Apparatus for generating a receipt, the apparatus comprising:

5 an input portion for receiving a slip having characters thereon;

electrical imaging means for forming an image of a slip in or at said input portion and generating an electrical image signal representing said image; and

10

output means for receiving said image signal and generating therefrom a receipt comprising a hard copy of said image together with additional identifying information.

15

2. Apparatus according to claim 1, wherein said input portion comprises a recess to receive a slip therein.

3. Apparatus according to claim 1 or 2, wherein said electrical imaging means comprises a two-dimensional array of charge-coupled devices.

20

4. Apparatus according to any of the preceding claims, wherein said output device comprises a thermal printer.

25

5. Apparatus according to any of the preceding claims, wherein said additional identifying information is adjacent said image on said hard copy.

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6. Apparatus according to any of the preceding claims, further comprising key means for entering control instructions for said apparatus and/or information which is displayed on said receipt with said image.
- 5 7. Apparatus according to any of the preceding claims, further comprising storage means for storing successive said image signals.
8. Apparatus according to claim 7, further comprising display means for selectively displaying an image corresponding to a selected one of said image  
10 signals stored in said storage means.
9. Apparatus according to claim 8, further comprising key means for entering data, and means for storing the entered data in said storage means with the respective said image signal corresponding to an image that is displayed on said display means at the time that the data is entered by said key  
15 means.
10. Apparatus according to claim 9, wherein said display means is arranged to display a respective said image at one portion of a display area, and  
20 additional data at at least one other portion of the display area, which data can be selected or entered by said key means for entering data.
11. Apparatus according to any of the preceding claims, further comprising a cash drawer.  
25
12. Apparatus according to any of the preceding claims, further comprising a magnetic card reader, means for carrying out a transaction with a card read

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by said reader, and means for storing data corresponding to an amount of money received by such a transaction.

13. Apparatus according to claim 7 or to any claims 8 to 12 as appendant thereto, further comprising a bar code reader for reading a bar code on a said receipt, means for decoding the read bar code, and means for retrieving from said storage means data relating to said receipt.

14. Apparatus according to any of the preceding claims, further comprising communication means for receiving and/or transmitting data from and/or to a remote station.

15. Apparatus according to claim 14, arranged to receive current values of variable betting data from a remote station.

16. A plurality of apparatuses according to claim 14 or 15, arranged to share and process common data.

17. A combination of at least one apparatus according to any of the preceding claims, together with a said slip which is a betting slip containing information relating to a bet to be placed.

18. A betting shop provided with at least one apparatus according to any of the preceding claims.

25  
19. Apparatus for generating a receipt and storing data relating to a transaction, the apparatus comprising:

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an input portion for receiving a slip having characters thereon;

5        electrical imaging means for forming an image of a slip in or at said input portion and generating an electrical image signal representing said image;

means for storing said electrical image signal; and

10      output means for generating a receipt comprising said slip or a hard copy of said image, together with additional identifying information.

20.     Apparatus according to claim 19, further comprising any one or more of the features disclosed in the accompanying specification, claims, abstract and/or drawings, in any combination.

15

21.     A method of generating a receipt, comprising the steps of:

locating a slip in or at the input portion of an apparatus according to any of the preceding claims;

20

forming an image of the slip and generating an electrical image signal representing the image by the electrical imaging means of the apparatus; and

25

generating the receipt by the output means of the apparatus, the receipt comprising said slip or a hard copy of said image, together with additional identifying information.

1/5

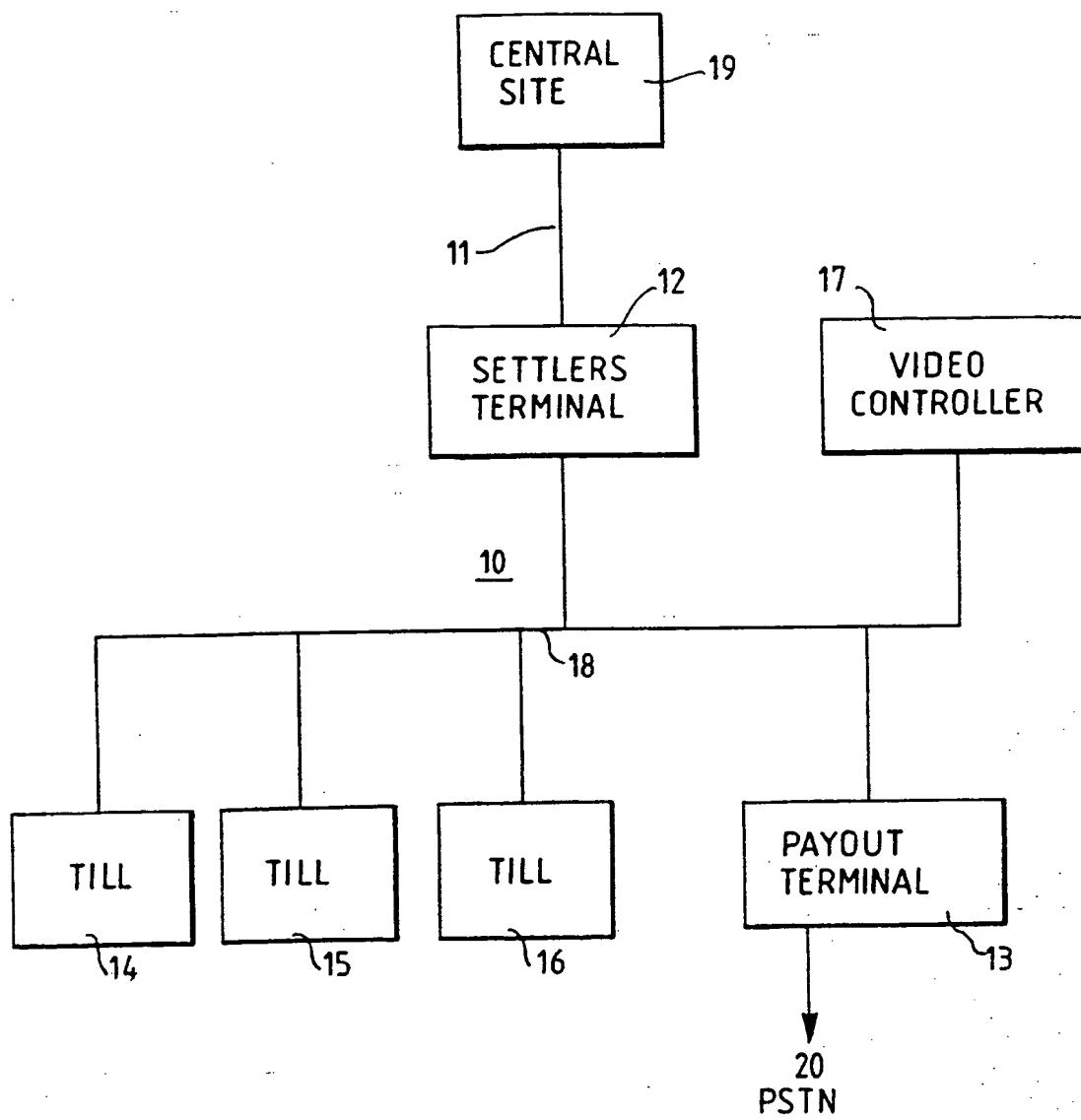
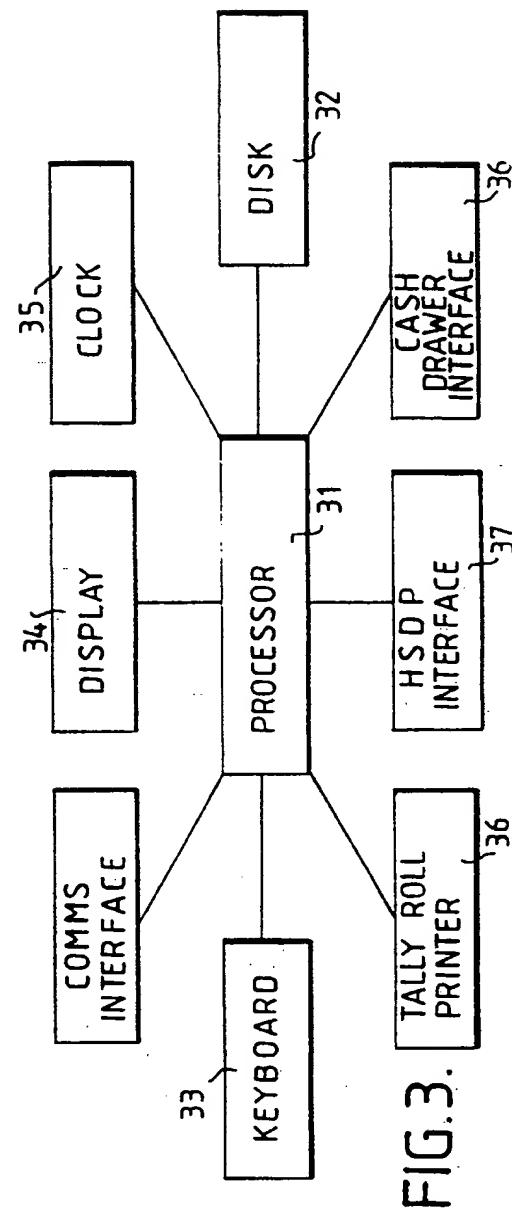
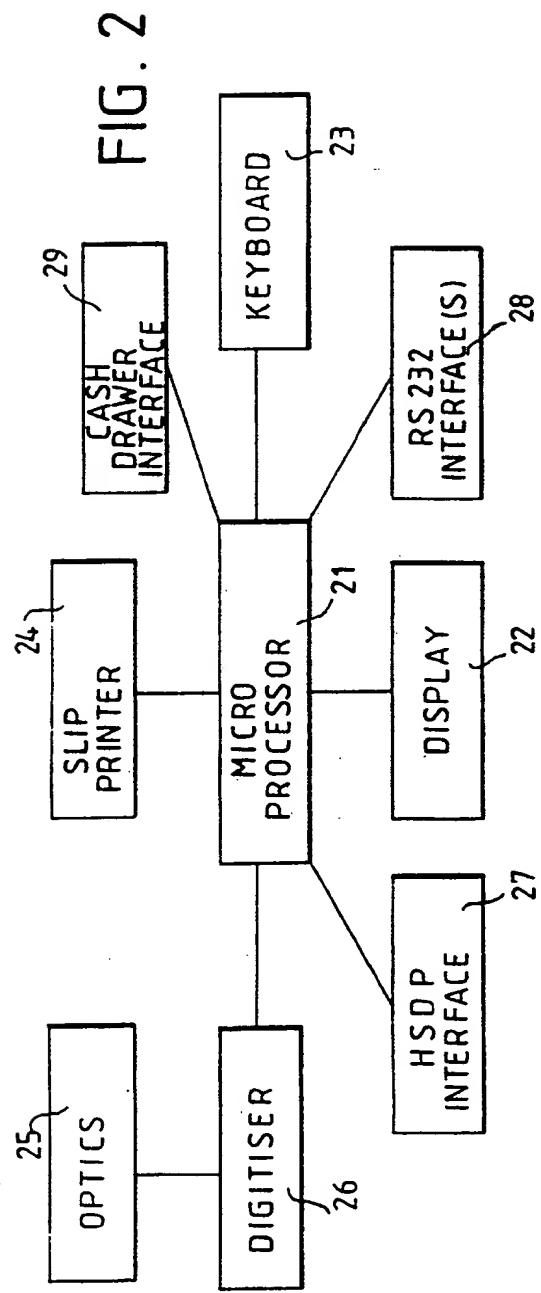


FIG. 1

2 / 5



3/5

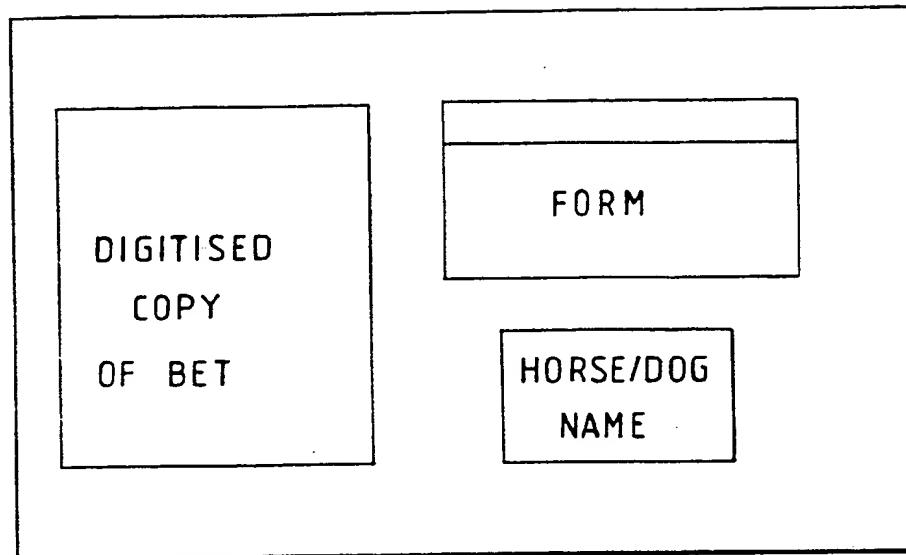


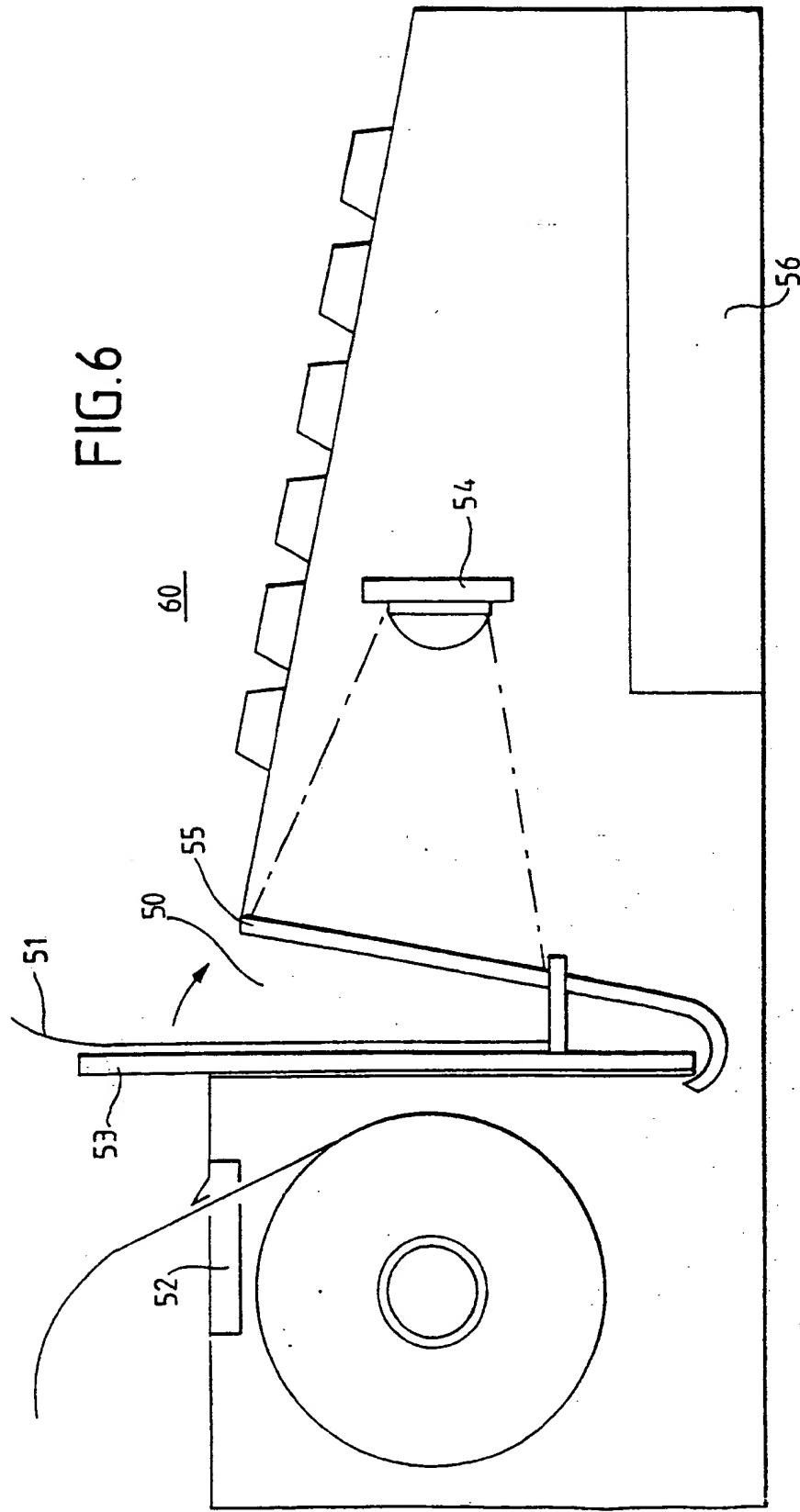
FIG.4

1	WIN	3	F C	5	TR1	7	ACC 1
2	E/W	4	RF/C	6	RTR1	8	ACC 2
NAME				9	S.P.		
10	RACING RULES				STAKE		
11	TAX PAID				TOTAL		

FIG.5

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FIG. 6



5 / 5

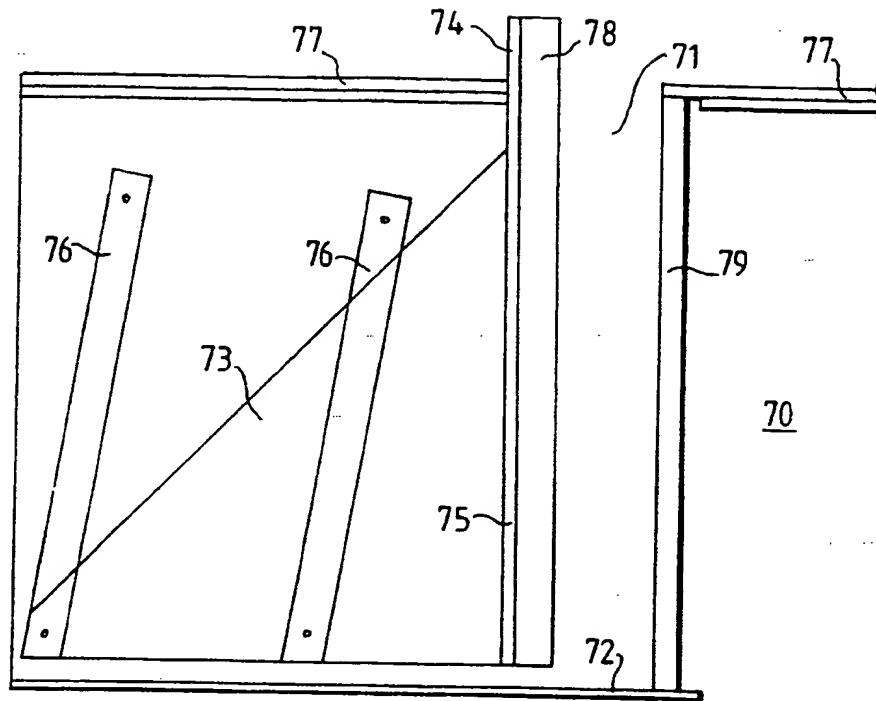


FIG. 7

JOE SMITH RACING	
STAKE & SELECTION	MEETING
Lucky Bernadette £5 WIN	2.30 York.
STAKE £5.00	PAYOUT £
TAX £0.50	
TOTAL £5.50	

80

81

82

FIG. 8

## INTERNATIONAL SEARCH REPORT

PCT/GB 92/00449

International Application No.

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)<sup>6</sup>

According to International Patent Classification (IPC) or to both National Classification and IPC  
 Int.C1. 5 G07B5/04; G07G5/00; G06F15/28

## II. FIELDS SEARCHED

Minimum Documentation Searched<sup>7</sup>

Classification System	Classification Symbols			
Int.C1. 5	G07B ; G06F ;	G07C ; G06K ;	G07F ; A63F	G07G

Documentation Searched other than Minimum Documentation  
 to the Extent that such Documents are Included in the Fields Searched<sup>8</sup>

III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup>

Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
X	EP,A,0 109 038 (WANG LABORATORIES) 23 May 1984 see page 4, line 25 - page 7, line 8 see page 8, line 14 - page 9, line 9; claims 1-9; figures	1,4-10 14,19-21
Y	---	2,3,11, 12,15-18
X	GB,A,2 089 165 (CANON) 16 June 1982 see page 1, line 125 - page 2, line 111 see page 4, line 103 - line 121; figures ---	1,3,5-7, 19,21
Y	AU,A,458 244 (AUERBACH) 23 December 1971 see page 10, line 9 - page 19, line 6 see page 46, line 14 - page 52, line 3; claims 1-4; figures ---	1,4-7, 12-21
		-/-

\* Special categories of cited documents :<sup>10</sup>

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

## IV. CERTIFICATION

Date of the Actual Completion of the International Search

10 JUNE 1992

Date of Mailing of this International Search Report

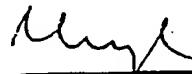
24.06.92

International Searching Authority

EUROPEAN PATENT OFFICE

Signature of Authorized Officer

MEYL D.



III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		Relevant to Claim No.
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Y	EP,A,0 304 519 (HALO) 1 March 1989 see column 4, line 7 - line 29; figures ---	2
Y	EP,A,0 240 203 (BALLY) 7 October 1987 see column 5, line 32 - column 7, line 25 see column 8, line 16 - line 32; figures	5-7,11, 14
A	---	1-3,8,9, 14,19-21
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A	US,A,4 108 364 (TANAKA) 22 August 1978 ---	
A	GB,A,2 071 369 (GENERAL INSTRUMENT) 16 September 1981 ---	

**ANNEX TO THE INTERNATIONAL SEARCH REPORT**  
**ON INTERNATIONAL PATENT APPLICATION NO. GB 9200449**  
**SA 57495**

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information. 10/06/92

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		GB-A-	1554585	24-10-79
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		AU-A-	6357380	30-04-81
		CA-A-	1144649	12-04-83